The e-waste dilemma

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UCI researchers Oladele Ogunseitan, left, and Jean-Daniel Saphores work with engineers, manufacturers and public health officials to help solve the growing problem of e-waste. Photo: Steve Zylius

(PhysOrg.com) -- Electronic devices could create significant environmental and health problems after they are thrown away. UC Irvine researchers are working with engineers, manufacturers and public health officials to find solutions.

As America's reliance on cell phones, computers and digital cameras grows, so too do concerns that toxic metals in these devices could create significant environmental and health problems after they are thrown away.

An estimated 2.3 million tons of discarded electronic products, or e-waste, are sent to U.S. landfills and incinerators annually, contaminating

groundwater and air with compounds like mercury, lead, zinc and cadmium that can cause birth defects, illnesses and death. And the e-waste dilemma is only getting worse - not just in this country but worldwide.

As Kermit the Frog says, "It's not easy being green," but UC Irvine researchers are working with engineers, manufacturers and public health officials to find solutions. They're seeking better ways to handle existing e-waste and to make future electronics "greener" - easier to recycle or dispose of.

A UCI team recently published in the *Journal of Environmental Management* a troubling portrait of the American household, which is steadily accumulating unused consumer electronics that threaten to accelerate the volume of e-waste.

The study - in which more than 2,000 residences were randomly surveyed - determined that the average U.S. home harbors four small items (like cell phones and digital cameras) and two or three large ones (like TVs and computers) of potential e-waste, raising the question: What will happen to it?

"And we think we're underestimating the total amount of household e-waste," says the study's lead author, Jean-Daniel Saphores, a civil & environmental engineering associate professor. "Our results call for developing a recycling infrastructure that includes targeted campaigns. But there is much more that needs to be done."

In October, Saphores teamed with Oladele Ogunseitan of UCI to author a Policy Forum article in Science that analyzed the complex legislative and industrial issues hindering e-waste solutions.

It sheds light on the ineffective maze of e-waste recycling and disposal

practices from state to state and urges the U.S. and other countries to standardize policies and step up enforcement of anti-dumping laws.

In addition, Saphores and Ogunseitan press for engineering advances, such as alternatives to toxic metals and designs that are easier to deconstruct. Currently, they point out, it's difficult to extract contaminants from most electronic devices, making recycling time-consuming and cost-prohibitive.

"We need to engineer and manufacture for the life of the product - from when it's built to when it's thrown away," Saphores says. "This approach can make recycling more widespread and efficient."

Ogunseitan, professor and chair of the Department of Population Health & Disease Prevention, adds that legislation like the Electronic Device Recycling Research & Development Act - now under review by the U.S. Senate - is key to incentivizing the search for solutions.

"Addressing e-waste involves collective and personal responsibility," says Ogunseitan, an internationally recognized expert on the toxicology of industrial pollutants.

"Collectively, our representatives need to follow through on laws and initiatives that standardize practices and encourage research on green products. And personally, we need to know how to properly dispose of e-waste so it's reused and put our money where our mouths are and buy greener electronics."

Provided by UC Irvine

https://phys.org/news/2009-11-e-waste-dilemma.html